DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 1/30/2008 have been fully considered but they are not persuasive. The applicant asserts that Pfaff does not teach " selecting at least one noise source sound as a calibration reference". The examiner disagrees. Pfaff discloses an input signal associated with the engine induction noise (column 5, lines 53-56 and column 7, lines 36-column 8). Pfaff further teaches of generating a plurality of input signals for different channels (column 6, lines 57-64) and that the input channels each have noise associated with that channel and that based upon an input signal associated with engine noise a cancelling output is produced (column 5, lines 45-56). Pfaff further teaches of a sample value for an input signal representing multiple harmonic noise components is looked up in an input table containing a schedule of values that vary as a function of the COUNT found in previous step 54 (column 7, line 36-column 8,line 55). The examiner is maintaining the rejection but is making the action non-final because the examiner neglected to include all of the citations noted above.

2. The applicant further asserts that Cairns fails to teach of comparing an actual system response to an expected system response to allow for calibration. The examiner disagrees. Cairns discloses that The noise reduction control device 40 determines one or more noise reduction algorithm parameters based on the reported vehicle conditions (block 230). For instance, the noise reduction control device 40 may compare the reported vehicle conditions against a look-up table that indicates the set of

noise reduction algorithm parameters to be used for each combination of vehicle conditions. One process for providing such stored sets of noise reduction algorithm parameter values is discussed further below. This reads on the claim language. The examiner is maintaining the rejection.

3. The applicant failed to address the 112 1st new matter rejection set forth in the previous office action, therefore the examiner is maintaining the 112 1st new matter rejection.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 21 and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 21 and 22 recite "..repeatedly calibrating the system over time...". Upon further investigation, the examiner has determined that this is not disclosed in the specification. This was added in the amendment filed on 12/20/2006 and therefore constitutes new matter.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims **1-20** rejected under 35 U.S.C. 103(a) as being unpatentable over Pfaff et al (US 5,146,505) in view of Cairns (US 2002/0097884).

Regarding claim 1,Pfaff discloses a method of calibrating an active noise control system (Figures 1-5; abstract), comprising:

selecting at least one noise source sound as a calibration reference (input signal associated with the engine induction noise; column 5, lines 38-57; column 7, lines 36-column 8, line 55; column 6, lines 57-64) and that the input channels each have noise associated with that channel (column 5, lines 45-52);

determining an actual system response to the calibration reference (signal form either of the microphones reads on actual response) ; and

calibrating the system in response to a calibration reference (column 5, line 51-column 7, line 25; column 7, line 58-column 8, line 50).

Pfaff fails to disclose calibrating to accommodate for any difference between the determined actual system response and an expected system response to the calibration reference. Cairns discloses comparing an actual system response to an expected system response to allow for calibration (page 2, paragraph 0014). It would have been

obvious to modify Pfaff by comparing an actual system response to an expected system response for the purpose of having an improved method of calibrating the system.

Regarding claim 2, Pfaff as modified discloses including selecting a plurality of dominant noise order source sounds and wherein the controller uses a plurality of dominant order noise source sounds (Pfaff;column 4, lines 4-26).

Regarding claim 3, Pfaff as modified discloses including determining the system response to the sound, determining a harmonic representation of the determined response and using the determined harmonic representation as the calibration reference and a controller that determines the system response and a harmonic representation of the determined response, the controller using the determined harmonic representation as the calibration reference (Pfaff; column 5, line 22- column 6, line 9; column 8, lines 7-50).

Regarding claim 4, Pfaff as modified discloses including subsequently determining an actual harmonic representation of the system response to the same sound and determining whether the actual harmonic representation corresponds to the calibration reference and a controller that determines an actual harmonic representation of the system response at a selected time and determines whether the actual harmonic representation corresponds to the calibration reference (Pfaff; column 5, line 8- column 6, line 9; column 8, lines 7-50).

Regarding claim 5, Pfaff as modified discloses wherein the system response comprises a microphone signal indicative of a sound detected by the microphone (Pfaff; column 5, lines 53-column 6, line 9).

Regarding claim 6 Pfaff as modified discloses wherein the noise source is a vehicle engine and including determining the harmonic representation at a plurality of engine speeds and a plurality of throttle conditions (Pfaff; abstract; column 4, lines 5-26; column 5 line 22- column 6, line 9; column 8, lines 7-50).

Regarding claim 7, Pfaff as modified discloses wherein the noise source is a vehicle engine having a number of cylinders and the selected sound is from a dominant order which is a factor applied to the number of cylinders (Pfaff; abstract; column 4, lines 5-26; column 5 line 8- column 6, line 9; column 8, lines 7-50).

Regarding claim 8, Pfaff as modified teaches that the dominant order is a factor applied to the number of cylinders (Pfaff; column 5, lines 8-20). Pfaff as modified fails to disclose that the selected sound is from a dominant order having a factor of ½. The examiner takes official notice that it is known in the art that the factor applied to the number of cylinders is determined by a designer according to what will provide the most optimal conditions for noise reduction. It would have been obvious to one of ordinary skill in the art to have the selected sound be from a dominant order having the desired factor of ½ in order to meet design specifications and provide the most optimum environment for reducing noise.

Regarding claim 9, Pfaff as modified discloses including estimating a noise source sound as an inverse of a produced cancellation signal; and the controller using the estimated noise source sound as the selected at least one noise source sound (Pfaff; column 4, lines 5-26; column 5 line 8- column 6, line 9; column 8, lines 7-50).

Regarding claim 10, Pfaff as modified discloses including estimating a noise source sound as the difference between a system response to the noise source sound and a produced cancellation signal; and the controller using the estimated noise source sound as the selected at least one noise source sound (Pfaff; column 4, lines 5-26; column 5 line 8- column 6, line 9; column 8, lines 7-50).

Regarding claim 11, Pfaff discloses a noise control system (Figures 1-5), comprising:

a microphone that detects a sound (30 microphone, Figure 1);

a speaker (28 speaker Figure 1); and

a controller that drives the speaker to selectively generate a noise cancellation signal and interprets a signal from the microphone indicating a resulting system response to a combination of a noise source sound and the noise cancellation signal, the controller using at least one noise source sound as a calibration reference, the controller determining an actual system response to the calibration reference (controller 26, Figure 1; column 5, line 36-column 7, line 25; column 7, line 58-column 8, line 50).

Pfaff fails to disclose calibrating to accommodate for any difference between the determined actual system response and an expected system response to the calibration reference. Cairns discloses comparing an actual system response to an expected system response to allow for calibration (page 2, paragraph 0014). It would have been obvious to modify Pfaff by comparing an actual system response to an expected system response for the purpose of having an improved system for calibrating.

Regarding claim 12, Pfaff as modified discloses including selecting a plurality of dominant noise order source sounds and wherein the controller uses a plurality of dominant order noise source sounds (Pfaff;column 4, lines 4-26).

Regarding claim 13, Pfaff as modified discloses including determining the system response to the sound, determining a harmonic representation of the determined response and using the determined harmonic representation as the calibration reference and a controller that determines the system response and a harmonic representation of the determined response, the controller using the determined harmonic representation as the calibration reference (Pfaff; column 5, line 22- column 6, line 9; column 8, lines 7-50).

Regarding claim 14, Pfaff as modified discloses including subsequently determining an actual harmonic representation of the system response to the same sound and determining whether the actual harmonic representation corresponds to the calibration reference and a controller that determines an actual harmonic representation of the system response at a selected time and determines whether the actual harmonic representation corresponds to the calibration reference (Pfaff; column 5, line 8- column 6, line 9; column 8, lines 7-50).

Regarding claim 15, Pfaff as modified discloses wherein the noise source is a vehicle engine and including determining the harmonic representation at a plurality of engine speeds and a plurality of throttle conditions (Pfaff; abstract; column 4, lines 5-26; column 5 line 22- column 6, line 9; column 8, lines 7-50).

Regarding claim 16, Pfaff as modified discloses wherein the noise source is a vehicle engine having a number of cylinders and the selected sound is from a dominant order which is a factor applied to the number of cylinders (Pfaff; abstract; column 4, lines 5-26; column 5 line 8- column 6, line 9; column 8, lines 7-50).

Regarding claim 17, Pfaff as modified teaches that the dominant order is a factor applied to the number of cylinders (Pfaff; column 5, lines 8-20). Pfaff as modified fails to disclose that the selected sound is from a dominant order having a factor of ½. The examiner takes official notice that it is known in the art that the factor applied to the number of cylinders is determined by a designer according to what will provide the most optimal conditions for noise reduction. It would have been obvious to one of ordinary skill in the art to have the selected sound be from a dominant order having the desired factor of ½ in order to meet design specifications and provide the most optimum environment for reducing noise.

Regarding claim 18, Pfaff as modified discloses including estimating a noise source sound as an inverse of a produced cancellation signal; and the controller using the estimated noise source sound as the selected at least one noise source sound (Pfaff; column 4, lines 5-26; column 5 line 8- column 6, line 9; column 8, lines 7-50).

Regarding claim 19, Pfaff as modified discloses including estimating a noise source sound as the difference between a system response to the noise source sound and a produced cancellation signal; and the controller using the estimated noise source sound as the selected at least one noise source sound (Pfaff; column 4, lines 5-26; column 5 line 8- column 6, line 9; column 8, lines 7-50).

. Regarding claim 20, Pfaff as modified discloses wherein the system response comprises a microphone signal indicative of a sound detected by the microphone (Pfaff; column 5, lines 53-column 6, line 9).

5. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pfaff et al (US 5,146,505) in view of Cairns (US 2002/0097884) in further view of Nadim (US 5,434,925).

Regarding claim 21, Pfaff as modified fails to explicitly teach of the controller repeatedly calibrating the system over time. Nadim discloses an active noise reduction system that repeatedly calibrates over time (column 1, lines 32-46). It would have been obvious to modify Pfaff as modified so that the controller repeatedly calibrates the system over time as taught by Nadim in order to have an improved apparatus for canceling noise.

Regarding claim 22, Pfaff as modified fails to explicitly teach of the controller repeatedly calibrating the system over time. Nadim discloses an active noise reduction system that repeatedly calibrates over time (column 1, lines 32-46). It would have been obvious to modify Pfaff as modified so that the controller repeatedly calibrates the system over time as taught by Nadim in order to have an improved apparatus for canceling noise.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devona E. Faulk whose telephone number is 571-272-7515. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Devona E. Faulk/
Examiner
Art Unit 2615
4/10/2008